

**CITY OF HARRISON (PWSNO 1280083)
SOURCE WATER ASSESSMENT REPORT**

December 12, 2000



**State of Idaho
Department of Environmental Quality**

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Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with well and aquifer characteristics.

This report, *Source Water Assessment for the City of Harrison, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of Harrison drinking water system consists of two wells. Both Well 1 and Well 2 are ranked moderately susceptible to contamination from inorganic chemicals (IOCs), volatile organic chemicals (VOCs), synthetic organic chemicals (SOCs) and microbes. A routine water test in August 1998 detected the presence of coliform bacteria, apparently isolated in a small segment of the distribution system. Subsequent sampling showed that the problem had been corrected. The city is currently planning to upgrade its wells and booster pump stations. Di(2-ethylhexyl)phthalate was detected in a sample from Well 2 submitted for analysis in November, 1993, at a concentration of 9.3 micrograms per liter, which exceeds the Maximum Contaminant Limit (MCL) of 4.0 micrograms per liter. An investigation revealed probable sampling technique errors. The chemical was not detected in quarterly samples analyzed in 1994.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Source water protection activities related to agriculture, for example, should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and local Soil Conservation District, and the Natural Resources Conservation Service. Due to the time involved with the movement of groundwater, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term..

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact your regional IDEQ office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF HARRISON, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (IDEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. IDEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

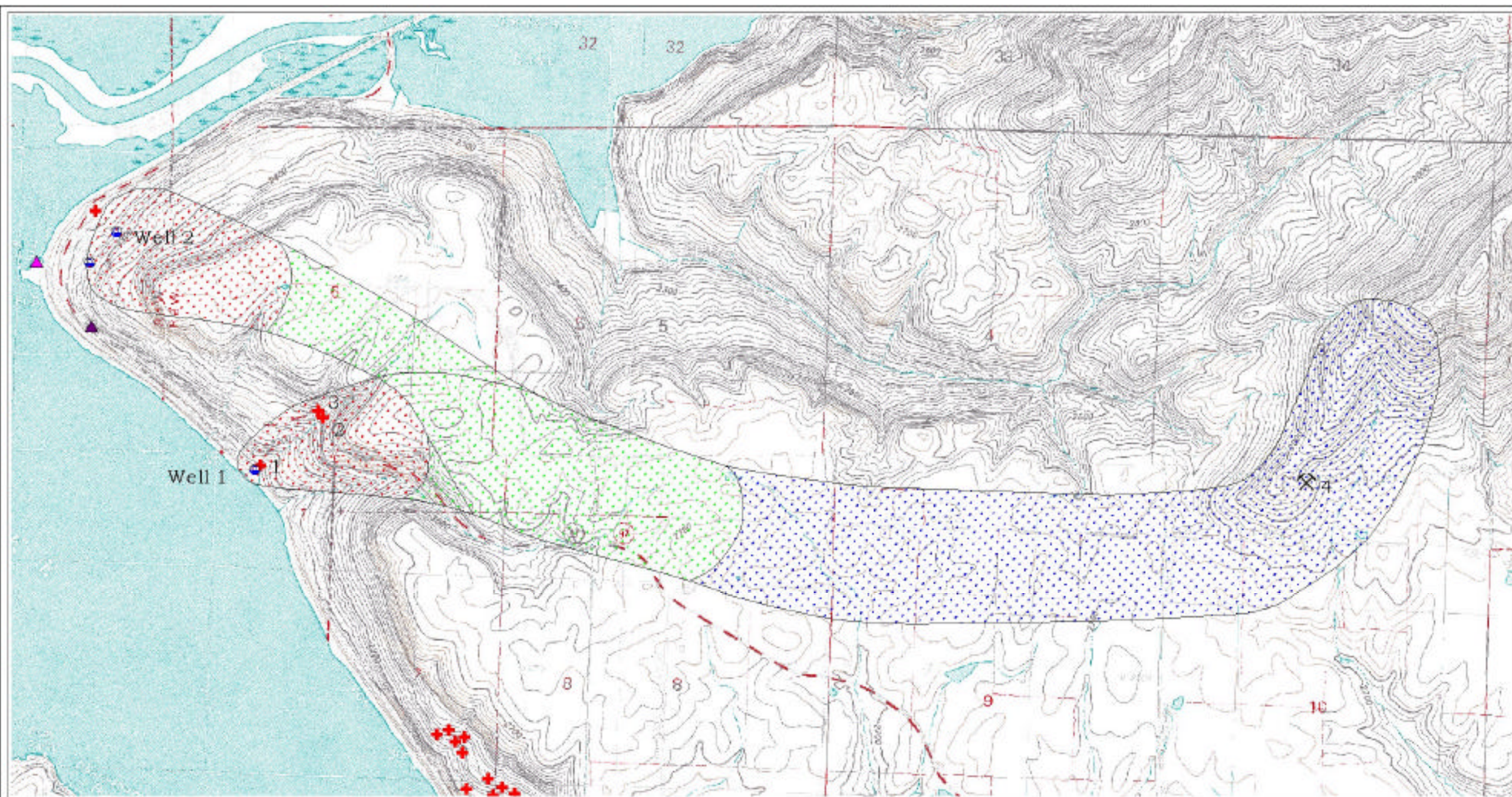


Figure 2
City of Harrison PWSNO 1280083
Delineation Map and Contaminant Sources

This computer representation has been developed by DEQ from sources which have supplied data or information that has not been verified by DEQ. DEQ does not warrant the use for commercial purposes without verification by an independent professional qualified to verify such data or information. DEQ shall not be held liable for any loss or injury resulting from reliance upon the information shown. *Consent of the Regional Office to be used in this map shall be obtained as developing this map.*



Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Harrison, Idaho is a community of approximately 250 people located in Kootenai County, about 45 miles south of Coeur d'Alene on Highway 97. (Figure 1). The public drinking water system for Harrison is comprised of two wells, with about 162 connections.

The City of Harrison wells have had few historical water quality problems. The city is planning to upgrade the well infrastructure, main well and booster pump station to alleviate problems originating in the distribution system.

Defining the Zones of Contribution--Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. IDEQ used a refined computer model developed by the USGS and approved by the EPA in determining the 3-, 6-, and 10- year time of travel for water associated with the Silver Valley/Coeur d'Alene River aquifer in the vicinity of Harrison, Idaho. The computer model used site specific data, assimilated by IDEQ from a variety of sources including the Harrison and other local well logs. The delineated source water assessment areas for Harrison are about 2000 feet wide. The delineation for Well 1 trends eastward about three miles then curves to the northeast for another mile. The delineation for Well 2 curves half a mile to the south east from the well until it joins and follows the boundaries for the Well 1 delineation. The data used by IDEQ in determining the source water assessment delineation areas are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by IDEQ and from available databases.

The dominant land use in the vicinity of the City of Harrison is suburban dry land agriculture mixed with undeveloped forested and non-forested lands and recreational areas. The city is partially bounded by the Coeur d'Alene River and Lake Coeur d'Alene

Land use within the Harrison city limits consists of residential areas, small businesses, and light manufacturing. Homes within Harrison are connected to septic tanks or a sewage lagoon, while homes outside of town operate with individual septic systems. Harrison has a wastewater treatment lagoon located half a mile north east of Well 2 and a mile north of Well 1.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during December of 1998. The first phase involved identifying and documenting potential contaminant sources within the HARRISON Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by IDEQ. The second or enhanced phase of the contaminant inventory involved local efforts to identify additional potential sources and validate sources identified in phase one. This task was undertaken with the assistance of John Bokor of the Idaho Rural Water Association.

A total of four potential contaminant sites were identified within the delineated source water areas (see Table 1). Most of the potential contaminant sources within delineated source water areas are located near Well 1. Potential contaminants located in the Harrison delineated source water areas include petroleum products, paints, solvents, degreasers and microbials. (Figure 2).

Contaminants of concern are primarily related to the city shop, a boat storage and repair business, and septic tanks for a 15-house subdivision. Table 1 lists the potential contaminants of concern, time of travel zones, and information source.

Figure 1. Geographic Location of the City of Harrison



Table 1. City of Harrison Potential Contaminant Inventory

MAPID	NAME	TOT Zone (years)	Source of Information	Potential Contaminants
1	CITY SHOP	3 YR	enhanced inventory	PAINT, SOLVENTS, FUEL, SEALED WELL
2	BOAT STORAGE	3 YR	enhanced inventory	AST, OIL, BOAT STORAGE, MOTOR REPAIR, BOAT CLEANIN
3	15 HOME SUBDIVISION	3 YR	enhanced inventory	SEPTIC AND HOLDING TANKS
4	GRAVEL PIT	10 YR	Mine database	Sand & Gravel

Section 3. Susceptibility Analyses

Significant potential sources of contamination were ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristic, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity was moderate for both wells (see Table 2). While the soil classification in the vicinity of the wells is "moderately to well drained" and the depth to first water is less than 300 feet, the presence of clay, and shale layers retard the movement of contaminants from the surface to the aquifer. For both wells, these low permeability layers have a cumulative thickness of greater than 50 feet.

Well Construction

The construction of the Harrison public water system wells directly affects the ability of the wells to protect the aquifer from contaminants. The Harrison drinking water system consists of two wells that extract ground water for domestic and industrial uses. Well system construction scores were moderate for Wells 1 and 2, based on a 1997 sanitary survey showing compliance with well seal and flood protection standards. The well log for Well 1 shows casing and annular seals extending to a depth of 18 feet into a broken basalt, yellow clay layer. Surface seal details are not available on the well driller's report for Well 2. The wells are not in compliance with current Idaho Department of Water Resources standards, which require that wells be in conformance with the Recommended Standards for Water Works (1997). Specifically, the casing thickness is too thin and neither well was gravel packed.

The wells in the Harrison system are 300 and 330 feet deep. They extend into a confined aquifer comprised Columbia River Basalt with granular interflows. Well 1 is cased with 10-inch diameter steel to a depth of 74.5 feet and with 8 inch PVC to 200 feet below ground level. There is a puddling clay surface seal. Well 2, drilled in 1967 and deepened the following year, is cased with welded steel pipe to a depth of 310 feet.

Potential Contaminant Source and Land Use

Both wells rated moderately susceptible to contamination from inorganic chemicals (IOCs), volatile organic chemicals (VOCs), synthetic organic chemicals (SOCs) and microbes. Hydrological Sensitivity and System Construction scores added the largest numbers of points to the contaminant inventory rating.

A routine water test in August 1998 detected the presence of coliform bacteria. It was not factored into the susceptibility rating because it appears to have been related to the distribution system rather than indicating the presence of microbial contamination in the aquifer.

Di(2-ethylhexyl)phthalate was detected in a sample from Well 2 submitted for analysis in November 1993 at a concentration of 9.3 micrograms per liter, which exceeds the MCL of 4.0 micrograms per liter. Detection above a drinking water standard MCL will usually give a high susceptibility rating to a well. In this case, however, Di(2-ethylhexyl)phthalate was undetectable in subsequent samples, so it was not counted in the susceptibility scoring.

Susceptibility Summary

The Harrison drinking water system is currently free of significant water quality problems.

Wells in the Harrison system take their water from a confined aquifer of Columbia River Basalt with granular interflows. The presence of clay, and shale layers retard the movement of contaminants from the surface to the aquifer.

Table 2. Summary of City of Harrison Susceptibility Evaluation

Well	Susceptibility Scores									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	M	L	L	L	L	M	M	M	M	M
2	M	L	L	L	L	M	M	M	M	M

H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

H* - Indicates source automatically scored as high susceptibility due to presence of either a VOC, SOC or an IOC above the Maximum Contaminant Level in the finished drinking water.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For Harrison source water protection activities should focus on preserving current water quality. Zoning ordinances, easements and leases are possible measures for controlling potentially polluting activities over delineated area. Public education regarding the location of the city's water source; proper use and disposal of household chemicals; and cross connection prevention for all users of the water system are additional ideas the city may wish to implement. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of groundwater, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Assistance

Public water suppliers and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional IDEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving few than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257. for assistance with wellhead protection strategies.

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Attachment A

City of Harrison Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

Ground Water Susceptibility Report

Public Water System Name :

HARRISON CITY OF

Well# : WELL 1

Public Water System Number 1280083

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1. System Construction

SCORE

Drill Date	2/3/73	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1997
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		3

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	NO	0
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0
Total Hydrologic Score		3

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
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Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	0	2	2	1
(Score = # Sources X 2) 8 Points Maximum		0	4	4	2
Sources of Class II or III leacheable contaminants or 4 Points Maximum	YES	0	2	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		0	6	6	2

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Land Use Zone II	NO	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	

Total Potential Contaminant Source / Land Use Score - Zone III	1	0	0	0
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Cumulative Potential Contaminant / Land Use Score

1	6	6	2
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4. Final Susceptibility Source Score

6	7	7	7
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5. Final Well Ranking

Moderate	Moderate	Moderate	Moderate
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1. System Construction		SCORE		
Drill Date	4/8/68			
Driller Log Available	YES			
Sanitary Survey (if yes, indicate date of last survey)	YES	1997		
Well meets IDWR construction standards	NO	1		
Wellhead and surface seal maintained	YES	0		
Casing and annular seal extend to low permeability unit	NO	2		
Highest production 100 feet below static water level	NO	1		
Well located outside the 100 year flood plain	YES	0		
Total System Construction Score		4		

2. Hydrologic Sensitivity				
Soils are poorly to moderately drained	NO	2		
Vadose zone composed of gravel, fractured rock or unknown	NO	0		
Depth to first water > 300 feet	NO	1		
Aquitard present with > 50 feet cumulative thickness	YES	0		
Total Hydrologic Score		3		

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0
Farm chemical use high	NO	0	0	0
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0
Potential Contaminant / Land Use - ZONE 1B				
Contaminant sources present (Number of Sources)	NO	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0
4 Points Maximum		0	0	0
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		0	0	0

Potential Contaminant / Land Use - ZONE II				
Contaminant Sources Present	NO	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0
Land Use Zone II		0	0	0
Potential Contaminant Source / Land Use Score - Zone II		0	0	0

Potential Contaminant / Land Use - ZONE III				
Contaminant Source Present	YES	1	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone III		1	0	0
Cumulative Potential Contaminant / Land Use Score		1	0	0

4. Final Susceptibility Source Score		7	7	7
5. Final Well Ranking		Moderate	Moderate	Moderate

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as **Superfund** is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.